Christian-Albrechts-Universität zu Kiel
Institut für Geowissenschaften
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Institut für Geowissenschaften
(Sektion Geowissenschaften)
Geologie – Sedimentologie,
Küsten- und Schelfgeologie

RV LITTORINA 05/09

Cruise Report/Fahrtbericht

Südsylter Rückseitenwatt (Hörnum, North Sea)

4th May – 15th May 2009

Institut für Geowissenschaften
Christian-Albrechts-Universität, Kiel

Klaus Schwarzer & Melanie Herrmann

Kiel, May 2009

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1. List of Participants

• Dr. Klaus Schwarzer	chief scientist	IfG	05/05 – 13/05/09
• Dr. Hans-Christian Reimers	scientist	LLUR	11/05 - 12/05/09
• Sören Themann	scientist	IfG	04/05 - 08/05/09
• Melanie Herrmann	scientist	IfG	11/05 - 13/05/09
• Laura Alvarez Cabana	student	IfG	04/05 - 13/05/09
• Particia Canel Fernándec	student	IfG	04/05 - 13/05/09

IfG: Institut für Geowissenschaften (Institute of Geosciences, University of Kiel)

2. Introduction

Cruise RV Littorina 05/09 was conducted in the frame of the research project "Flächendeckende Erfassung benthischer Lebensraumtypen im Sublitoral des Hörnum Tiefs" (Survey of benthic habitats in the sublittoral of the Hörnum Tief). This project is part of the cooperation between the Institute of Geosciences at the University of Kiel and the Landesamt für Landwirtschaft, Umwelt und ländliche Räume (LLUR). The aim of this project is to survey benthic habitats in the tidal flats of the Hörnum Tief with a special focus on habitats for blue mussels. Questions to be answered are related to where substrates can be found, which are adequate for blue mussel settling and where already biogenic structures are existing. Furthermore the project should offer valuable clues to how the bottom substrates of the region are developed and in which range the mobility of the sediment in different parts of the Hörnum Tief is. During this cruise a C3D and a multibeam echosounder survey was performed in the Hörnum Tief area.

3. Cruise Narrative

04th May 2009:

Departure:	Kiel, 8:00 UTC
Activities:	Loading, transit through Nord-Ostsee-Kanal
Arrival:	Brunsbüttel, 17:30 UTC
Weather conditions:	cloudy; Wind: 5-6 Bft.

05th May 2009:

Departure:	Brunsbüttel, 06:45 UTC
Activities:	Transit to Sylt
Arrival:	Hörnum,Sylt, 17:30 UTC
Weather conditions:	cloudy; Wind: 5-6 Bft.

06th May 2009:

Departure:	Hörnum, 05:30 UTC
Activities:	Installation and check of scientific equipment. Side scan sonar survey profiles and multibeam survey profiles 06050901 to 06050906 in the study area Südsylter Rückseitenwatt and build up of vibro corer.
Arrival:	Hörnum, 17:00 UTC
Weather conditions:	cloudy; Wind: 5-6 Bft

07th May 2009:

Departure:	Kiel, 05:30 UTC
Activities:	Two CTD stations (at 08:00 UTC and 11:45 UTC). Multibeam survey profiles 07050901 to 07050914 in the study area Südsylter Rückseitenwatt.
Arrival:	Hörnum, 15:00 UTC
Weather conditions:	cloudy; Wind: 5-6 Bft

08th May 2009:

Departure:	Hörnum, 06:30 UTC
Activities:	Benthos C3D survey profiles and multibeam survey profiles 08050903 to 08050912 in the study area Südsylter Rückseitenwatt.
Arrival:	Hörnum, 13:00 UTC
Weather conditions:	cloudy; Wind: 3-4 Bft

09th May 2009:

Departure:	Hörnum, 05:30 UTC
Activities:	Benthos C3D survey profiles and multibeam survey profiles 09050901 and 09050902, grab sampling of samples 0509-1 to 0509-37, taking of core 1 and 2 in the study area Südsylter Rückseitenwatt.
Arrival:	Hörnum, 15:00 UTC
Weather conditions:	cloudy; Wind: 3-4 Bft

10th May 2009:

Departure:	Hörnum, 07:45 UTC
Activities:	Benthos C3D survey profiles and multibeam survey profiles 10050901 to 09050911, grab sampling of samples 0509-1 to 0509-37, taking of core 3 and 4 in the study area Südsylter Rückseitenwatt.
Arrival:	Hörnum, 15:00 UTC
Weather conditions:	sunny; Wind: 3-4 Bft

11th May 2009:

Departure:	Hörnum, 05:30 UTC
Activities:	Benthos C3D survey profiles and multibeam survey profiles 11050901 to 11050915 and video surveying in the study area Südsylter Rückseitenwatt.
Arrival:	Hörnum, 15:00 UTC
Weather conditions:	sunny; Wind: 3-4 Bft

12th May 2009:

Departure:	Hörnum, 05:45 UTC
Activities:	Benthos C3D survey profiles and multibeam survey profiles 12050901 to 12050916 and video surveying in the study area Südsylter Rückseitenwatt.
Arrival:	Hörnum, 14:40 UTC
Weather conditions:	sunny; Wind: 3-4 Bft

13th May 2009:

Departure:	Hörnum, 05:40 UTC
Activities:	grab sampling of samples 0513-38 to 0513-77, taking of core 5 and video surveying in the study area Südsylter Rückseitenwatt.
Arrival:	Hörnum, 15:00 UTC
Weather conditions:	sunny; Wind: 3-4 Bft

4. Equipment

4.1 C3D

The equipment used for this survey was a C3D. Which consist of a high-resolution side scan sonar system, a multibeam system and a CTD. The C3D sonar system was towed behind the vessel running with a speed of about 5 knots. A range of 50m on each side was applied. The raw data was stored digitally on hard disc (and CD-ROM later on) using the Isis SONAR software (Triton Elics).

4.2 Multibeam Echosounder

Multibeam-surveys were performed with the shipboard SeaBeam 1185 (L3-Communications, ELAC Nautik GmbH), which operates with a sonar frequency of 180 kHz. The system collects bathymetric and side scan data simutaneously with a swath width of 153.5°. The profiles were run with a vessel speed of 5 knots. The data was acquired and recorded using the software Hydrostar (L3-Communications, ELAC Nautik GmbH).

4.3 Van Veen Grab Sampler

The Van Veen Grab Sampler was used to take sediment grab samples of the sea bottom to calibrate the side scan system surveys.

4.4 Vibro corer

The Van Vibro corer was used to take cores of the seabottom to calibrate the subbottom profiler surveys.

5. Performed work and preliminary Results

76 side scan sonar profiles, 76 multibeam survey profiles (Tab. 1) and 6 videos were performed as well as 77 grab samples and 5 cores were taken in the study area Südsylter Rückseitenwatt. Some blue mussels habitats were found during the survey already. The mapped seafloor is mainly built up by fine sands.

6. Appendices

Table 1: Side scan sonar and multibeam profiles performed in the study area Südsylter Rückseitenwatt during the cruise RV Littorina 05/09

Profile	Date	Start			End		
		Time(UTM)	Latitude N	Longitude E	Time(UTM)	Latitude N	Longitude E
06050901	06.05.2009	05:59	54,740548	82,998160	06:32	54,773854	83,425274
06050902		06:33	54,773479	83,434012	07:09	54,740173	83,006895
06050903		07:10	54,739799	83,015630	07:46	54,773104	83,442750
06050904		07:47	54,772729	83,451488	08:26	54,739424	83,024364
06050905		08:27	54,739049	83,033098	09:08	54,772355	83,460225
06050906		09:10	54,771980	83,468963	09:52	54,738675	83,041833
07050901	07.05.2009	05:48	54,738300	83,050567	06:24	54,771605	83,477700
07050902		06:25	54,771230	83,486437	07:04	54,737926	83,059300
07050903		07:05	54,737551	83,068034	07:35	54,770855	83,495174
07050904		07:38	54,770480	83,503911	08:17	54,737176	83,076768
07050905		08:18	54,736802	83,085501	08:46	54,770105	83,512648
07050906		08:50	54,769730	83,521384	09:28	54,736427	83,094234
07050907		09:29	54,736052	83,102967	10:00	54,769355	83,530120
07050908		10:01	54,768980	83,538857	10:36	54,735678	83,111700
07050909		10:38	54,735303	83,120433	11:09	54,768605	83,547593
07050910		11:10	54,768230	83,556328	11:39	54,734928	83,129165
07050911		13:10	54,734554	83,137898	13:38	54,767855	83,565064
07050912		13:39	54,767480	83,573800	14:12	54,734179	83,146630
07050913		14:13	54,733804	83,155362	14:44	54,767105	83,582535
07050914		14:46	54,766730	83,591270	15:24	54,733430	83,164094
08050901	08.05.2009	07:01	54,733055	83,172826	07:34	54,766355	83,600005
08050902		07:35	54,773854	83,425274	08:02	54,791164	84,270479
08050903		08:03	54,790580	84,275197	08:44	54,773345	83,432978
08050904		08:46	54,772867	83,442228	09:31	54,790023	84,279703
08050905		09:32	54,788856	84,255444	10:14	54,772393	83,451633
08050906		10:15	54,771980	83,464030	10:56	54,787022	84,198485
08050907		10:59	54,785538	84,158346	11:35	54,771485	83,472468
08050908		11:39	54,771055	83,484024	12:15	54,785107	84,169898
08050909		12:18	54,784623	84,178829	12:53	54,770571	83,492959
08050910		12:55	54,770061	83,500662	13:30	54,784113	84,186525
08050911		13:33	54,783630	84,195533	14:10	54,769579	83,509674
08050912		14:11	54,769132	83,520443	14:46	54,783183	84,206297
09050901	09.05.2009	14:25	54,782667	84,213720	14:58	54,768617	83,527871
09050902		14:59	54,768200	83,540070	15:35	54,782249	84,225915
10050901	10.05.2009	08:15	54,781799	84,236527	08:42	54,767750	83,550686
10050902		08:55	54,767292	83,560881	10:04	54,781340	84,246719

10050903		09:31	54,780878	84,256778	10:06	54,766831	83,570944
10050904		10:07	54,766353	83,580177	10:43	54,780400	84,266006
10050905		10:45	54,779914	84,274869	11:16	54,765867	83,589046
10050906		11:18	54,765409	83,599241	11:55	54,779455	84,285060
10050907		11:57	54,796092	84,403874	12:32	54,818031	84,665718
10050908		12:42	54,817673	84,674685	12:57	54,795735	84,412839
10050909		12:59	54,795378	84,421804	13:15	54,817316	84,683652
10050910		13:17	54,816959	84,692620	13:33	54,795021	84,430768
10050911		13:35	54,794664	84,439733	13:50	54,819876	84,740700
11050901	11.05.2009	06:20	54,819406	84,748316	06:41	54,794307	84,448697
11050902		06:43	54,793950	84,457661	06:56	54,819654	84,764508
11050903		06:59	54,820112	84,783222	07:15	54,793593	84,466625
11050904		07:17	54,793236	84,475589	07:31	54,820550	84,801694
11050905		07:34	54,820992	84,820202	07:49	54,792879	84,484553
11050906		07:51	54,783395	84,184837	08:05	54,795841	84,407684
11050907		10:14	54,795389	84,415249	10:30	54,782943	84,192403
11050908		10:32	54,782490	84,199968	10:48	54,794937	84,422814
11050909		10:50	54,794484	84,430379	11:05	54,782038	84,207533
11050910		11:08	54,781586	84,215097	11:24	54,794032	84,437943
11050911		11:25	54,793579	84,445508	11:41	54,781134	84,222662
11050912		12:04	54,780681	84,230226	12:29	54,793127	84,453072
11050913		12:32	54,792675	84,460636	12:55	54,780229	84,237791
11050914		12:56	54,779777	84,245355	13:20	54,792222	84,468200
11050915		13:22	54,791770	84,475764	13:44	54,779325	84,252919
11050916		13:46	54,778872	84,260482	14:10	54,791317	84,483327
12050901	12.05.2009	06:41	54,790865	84,490891	07:07	54,778420	84,268046
12050902		07:09	54,777968	84,275609	07:30	54,790412	84,498454
12050903		07:33	54,789960	84,506017	07:57	54,777515	84,283172
12050904		08:45	54,777063	84,290736	09:00	54,789507	84,513580
12050906		10:37	54,791630	84,471782	10:58	54,802565	84,765322
12050907		10:59	54,740548	82,998160	10:18	54,760550	83,016255
12050908		11:19	54,762073	83,028526	11:37	54,740515	83,009018
12050909		11:38	54,740482	83,019876	11:57	54,764054	83,041214
12050910		12:37	54,766114	83,053974	12:47	54,740449	83,030733
12050911		12:54	54,740416	83,041591	13:02	54,768424	83,066963
12050912		13:08	54,770460	83,079704	13:16	54,740383	83,052449
12050913		13:23	54,740350	83,063306	13:32	54,770527	83,090660
12050914		13:39	54,770410	83,101450	13:49	54,757087	83,089364
12050915		13:57	54,759891	83,102884	14:07	54,770372	83,112311
12050916		14:14	54,770329	83,123167	14:29	54,763584	83,117083

Table 2: Grab sample stations in the study area Südsylter Rückseitenwatt during cruise Littorina 05/09

Station	Date	Time(UTC)	Latitude N	Longitude E
0509-1	09.05.2009	05:42	54,741200	8,300853
0509-2B		05:50	54,742122	8,301650
0509-3		05:57	54,744037	8,302627
0509-4		06:02	54,745462	8,304335
0509-5		06:38	54,742308	8,305447
0509-6		06:43	54,745695	8,305280
0509-7		06:49	54,744832	8,308808
0509-8		06:53	54,740804	8,308087
0509-9		07:02	54,739258	8,307313

0509-10A		07:09	54,736215	8,311952
0509-10C		07:14	54,736230	8,311950
0509-11		07:19	54,736210	8,313007
0509-12		07:27	54,745068	8,314355
0509-13		07:49	54,741457	8,319303
0509-14		07:54	54,740323	8,302818
0509-15		08:12	54,739656	8,323158
0509-17		08:28	54,745356	8,325508
0509-18B		08:36	54,754033	8,321361
0509-19B		08:44	54,737761	8,320250
0509-20A		08:52	54,757300	8,320233
0509-20B		08:55	54,757139	8,320133
0509-20C		08:57	54,757372	8,320631
0509-21A		09:10	54,750467	8,332158
0509-21C		09:20	54,750283	8,332439
0509-22		09:28	54,752208	8,332892
0509-23		09:32	54,756242	8,336378
0509-24		09:40	54,757314	8,335811
0509-25		09:48	54,758567	8,331600
0509-26E		12:39	54,759836	8,338169
0509-27A		10:54	54,760311	8,339444
0509-27C		12:34	54,760150	8,339900
0509-28		11:01	54,760311	8,345542
0509-29		11:16	54,764675	8,334458
0509-31A		12:24	54,766142	8,340942
0509-32		11:31	54,771367	8,345225
0509-33		11:36	54,769167	8,348614
0509-34		11:41	54,764883	8,349625
0509-35		11:49	54,766019	8,351142
0509-36		12:00	54,767403	8,352372
0509-37		12:16	54,767150	8,363827
0513-38	13.05.2009	06:05	54,767758	8,360348
0513-39A		06:10	54,769753	8,357933
0513-39B		06:14	54,771213	8,357438
0513-40		06:21	54,770131	8,358319
0513-41		06:25	54,774362	8,346658
0513-42		06:30	54,773618	8,349232
0513-43		06:36	54,772580	8,364168
0513-44		06:40	54,776047	8,356727
0513-46		06:53	54,777258	8,366715
0513-47		06:57	54,777670	8,366715
0513-48		07:02	54,775352	8,357854
0513-49		07:07	54,776837	8,374519
0513-50		07:11	54,776862	8,381584
0513-51A		07:16	54,776863	8,381438
0513-51D		07:20	54,780868	8,397976
0513-52		07:26	54,784195	8,393682
0513-53		07:34	54,785928	8,405155
0513-54		07:38	54,786597	8,416477
0513-55		07:44	54,786219	8,424231
0513-56		07:50	54,799342	8,445122
0513-57		07:56	54,805200	8,451950
0513-58		08:10	54,808535	8,458352
0513-59		08:17	54,808461	8,458542
0513-60A		08:23	54,814194	8,465389

0513-60B		08:24	54,814042	8,465294
0513-61A		08:31	54,818225	8,467189
0513-61B		08:33	54,817978	8,466811
0513-62B		08:39	54,816692	8,469817
0513-62C		08:43	54,816714	8,469650
0513-63C		08:49	54,812417	8,469011
0513-64		08:55	54,796967	8,445492
0513-65		09:00	54,796083	8,449392
0513-66		09:10	54,792961	8,443817
0513-67		09:17	54,792858	8,442986
0513-68A		10:51	54,797861	8,474711
0513-68B		10:55	54,796958	8,474558
0513-69A		11:09	54,799167	8,475564
0513-69B		11:13	54,800764	8,479031
0513-70		11:17	54,800914	8,479328
0513-71D		11:25	54,779411	8,417947
0513-72		11:49	54,778850	8,413856
0513-73		11:59	54,775325	8,404533
0513-74		12:04	54,774611	8,399619
0513-75		12:10	54,774458	8,399703
0513-76B		12:17	54,771897	8,393539
0513-77C		12:27	54,770206	8,359486

Table 3: Coring stations in the study area Südsylter Rückseitenwatt during cruise Littorina 05/09

Core	Date	Time(UTC)	Latitude N	Longitude E
core 1	07.05.2009	13:43	54,775917	8,365000
core 2	09.05.2009	15:17	54,760845	8,340415
core 3	09.05.2009	15:54	54,760260	8,339537
core 4	10.05.2009	16:10	54,765173	8,355022
core 5	10.05.2009	16:53	54,779618	8,400728

Table 4: Video stations in the study area Südsylter Rückseitenwatt during cruise Littorina 05/09

Profile	Date	Start		End	
		Latitude N	Longitude E	Latitude N	Longitude E
video1	11.05.2009	54,7612694	8,34634722	54,7636167	8,34896667
video2		54,7787361	8,38992222	54,7809528	8,39949167
video3		54,7587883	8,35502222		
video4		54,8087883	8,46274167	54,8091111	8,46325000
video5		54,8079813	8,46515667	54,8075233	8,46398667
video6	12.05.2009	54,7756972	8,46438889	54,7896111	8,45233333

Fig. 1: Side scan sonar and multibeam profile lines performed during cruise RV Littorina 05/09 within the study area Südsylter Rückseitenwatt.

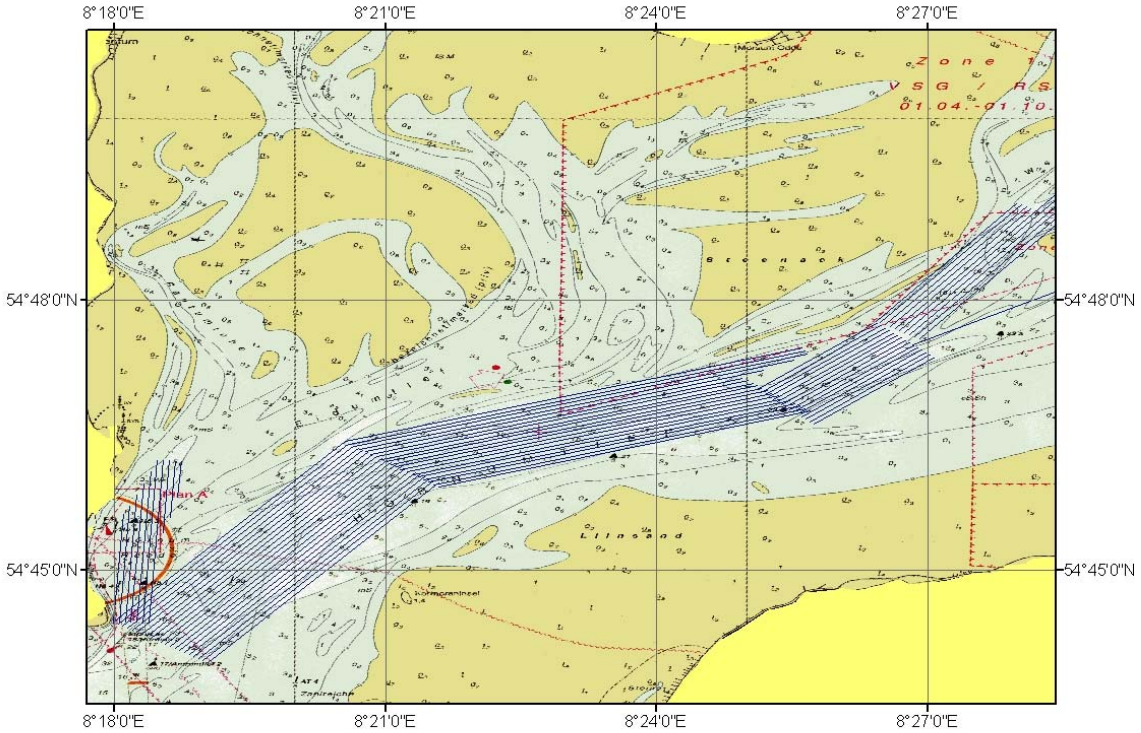

Fig. 2: Side scan mosaic and locations of grab samples (green dots) and cores (purple dots) performed during cruise RV Littorina 05/09 within the study area Südsylter Rückseitenwatt.